Evaluation of Standardized Tasks for Primary Care Physicians Using the MOXXI Electronic Prescribing and Integrated Drug Management System

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Background

The Medical Office for the Twenty First Century (MOXXI) is a research project testing the potential benefits of an electronic prescription and drug management system for primary care physicians. This system includes a dynamic electronic pad for prescription entry with fields for treatment indications; a drug profiler with a graphic representation of the list of prescription medications purchased in the last year; a refill compliance calculator; dates of emergency room visits and hospital admissions; cost of drugs dispensed; and an alert system that detects interactions among drugs, treatment duplications, and contraindications with certain allergies or specific diseases. One concern expressed by physicians that could influence uptake and acceptability is the increased time that may be required to use the system. User abilities are a factor in this process, as well as user interface, user training and system speed.

Objectives

To evaluate of the user's ability to utilize the system based on performance in a series of standardized tasks. The tasks were designed to replicate actual use of the system in the clinic. If the system and training program are well designed, the speed for performing these tasks should significantly improve over time.

Methods

Participating physicians were provided with a personal digital assistant with the MOXXI software and completed a series standardized tasks using a pseudo-database during the training session and at the end of the second week of in-clinic use. The tasks were: 1)logging on to the system, 2)retrieving the records of a pseudo-patient, 3)changing the status for one of the patient's health problems, 4)adding an allergy to the problem list, 5)writing a prescription for three medications, including the drug, dose, duration and indication, and 6)re-prescribing eight medications. A research assistant recorded the number of seconds that were required to complete each task. The system capacity (gold standard) for the task was set by the physician coordinator who had the most experience with the system (fastest time possible). Mean differences were compared using paired t-tests for physicians between time 1 to time 2, and for differences between physicians and the gold standard for both times.

Results

Of the 28 physicians who completed the initial training, 16 were retested at the end of week 2. On average, physicians significantly decreased the time for completing all tasks except Task 3, changing the status of a problem (decrease of 13.7 sec, $p=0.06$) and Task 6, renewing 8 prescriptions (decrease of 26.8 sec, $p=0.30$). The most improvement was seen for Task 5, (writing 3 electronic prescriptions) with an average decrease in time of 2 min 8 sec ($p<.0001$). The other tasks showed significant decreases in time of 4 sec (Task 1, logon) to 33 sec (Task 2, retrieve patient record). For testing during week 2, the mean time for physicians to complete the task was still longer than the gold standard with the greatest difference in Task 5, where physicians were on average 2 min 21 sec slower than the gold standard (range of 4 min 50 sec to 1 min 25 sec slower).

Conclusion

Physicians are improving their task times and approaching optimal times. For MOXXI, user ability will likely not be a barrier for adoption.